



# HYGIENETECH

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December 10, 2007

California State Board of Equalization  
450 N Street  
Sacramento, California 94279

Document No. 20710005.5

Attention: David Gau

Regarding: Cursory Fungal Growth Assessment Survey  
Room 143 (Mail Room)  
450 N Street, Sacramento, California

Dear Mr. Gau:

On October 19, 2007, Wesley B. Frey, Industrial Hygienist, with Hygiene Technologies International, Inc. (HygieneTech), visited the California State Board of Equalization building located at the above-referenced address for the purpose of conducting a cursory fungal growth assessment survey. On that date, HygieneTech was informed that American Technologies, Inc. (ATI), an abatement contractor, had HEPA vacuumed and wet wiped using a biocide a portion of the northern concrete wall on which suspect fungal growth had previously been observed. HygieneTech later observed ATI personnel performing the same activities on the flooring and wall material adjacent to the northern concrete wall suspect fungal growth, and applying an encapsulate paint to a portion of the northern concrete wall above the vinyl cove base. Note that the portion of the northern concrete wall beneath the vinyl cove base had not been cleaned or encapsulated at the time of the survey; however, HygieneTech was informed that representatives of the Department of General Services had subsequently cleaned and replaced the affected vinyl cove base.

During the survey, air samples were collected at various indoor locations and two additional air sample was collected at outdoor locations on the survey date for comparison purposes. Air samples were collected using a Zefon brand Bio-Pump™ equipped with Allergenco-D™ cassettes. Additionally, surface samples were collected from the northern concrete wall beneath the vinyl cove base. Surface samples were collected using Scotch® brand cellophane tape segments that were affixed to microscope slides. All such samples were subsequently analyzed for fungi (including yeasts, molds, rusts, smuts, and mushrooms) by trained and experienced microbiologists at a laboratory accredited by the American Industrial Hygiene Association (AIHA) and that successfully participates in the AIHA Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program. The analytical data with supporting and background information appear in the enclosed Tables 20710005-5 and 20710005-6.

On the survey date, the airborne total fungi data recorded indoors showed low levels of common fungi including *Alternaria*, ascospores, basidiospores, *Cladosporium*, and colorless spores typical of *Penicillium* and *Aspergillus* species. The spore types detected indoors matched those found outdoors, and the overall spore counts within Room 143 were well below the overall data recorded outdoors. Historical data indicate that indoor spore levels usually average 30 to 80 percent of the outdoor spore level at the time of sampling, with the same general distribution of spore types. The overall indoor data



recorded during the survey did not exceed 18 percent of the outdoor datum. However, as shown in Table 20710005-6, the surface sample data indicated fungal growth involving colorless spores typical of *Penicillium* and *Aspergillus* species on the northern concrete wall and mastic beneath the vinyl cove base.

Be advised that the data provided in this report only represent limited fungal growth and exposure potentials that existed at the time the survey was performed and at the precise sample locations indicated, the latter of which were selected based on the available background information provided. Note that fungal growth and exposure potentials may change due to changes in environmental conditions (such as those caused by water intrusion), use of mechanical systems, or other factors. Also be advised that additional fungal growth may exist at one or more locations in the structure that were not specifically assessed during the survey.

HygieneTech is providing general abatement recommendations below, which are offered based strictly on the assessment information and analytical data that were available to HygieneTech at the time this report was prepared.

- 1) Possible sources of the water intrusion should be identified or confirmed and the subsequent repairs made. If water intrusion occurs in the structure in the future, affected materials should be dried promptly so that fungal growth potentials are minimized.
- 2) The northern concrete wall beneath the vinyl cove base in Room 143 should be vacuumed with equipment having high efficiency particulate air (HEPA) filtration and the surfaces should then be abraded as needed to remove fungal growth, detail-cleaned with HEPA vacuum and/or other equipment, sanitized with a suitable biocide, and encapsulated with a biocide-based material. Such cleaning activities should occur at least two feet in all directions past any evidence of fungal growth.
- 3) After completion of the above-described work, all flooring and lower wall surfaces in the immediate work area should be detail-cleaned with the use of vacuums that have HEPA filtration.
- 4) All benches and machinery in the work area should be inspected for evidence of fungal growth and, if no such growth is observed, removed from the immediate work area prior to commencement of abatement work. If suspect fungal growth is observed, then those items should be cleaned as deemed appropriate using HEPA vacuums and/or biocide wet methods. All such items should then be stored in an area having no known fungal growth. If such items cannot be cleaned adequately using the available methods, then those items should be discarded.
- 5) An appropriately qualified and experienced contractor should perform all abatement work using engineering controls designed to reduce the potential for dispersion of spores and other airborne particulates. Personnel involved in the abatement efforts should be protected with, at a minimum, air-purifying respirators with HEPA filtration. Personnel should wear protective disposable clothing consisting of full-body coveralls, head covers, gloves, and boot covers during remediation activities. All personnel performing remediation should be informed of the hazards associated with exposures to fungi.
- 6) All industrial hygiene work should be performed by or under the direction of an individual who is certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH). An industrial hygienist well acquainted with fungal growth abatement procedures, use of appropriate personal protective equipment, and with the health hazards associated with exposure to fungi



should be present at one or more times during performance of the abatement work. Prior to encapsulation of surfaces, a visual inspection should be performed within the enclosed work areas by or under the direction of an ABIH-Certified Industrial Hygienist (CIH). When surfaces are suitably decontaminated, a biocide-based encapsulant should be applied to surfaces as specified. Following encapsulation, an industrial hygienist should perform a *clearance* survey, during which surface and air samples are collected within and outside of the enclosed work areas. The CIH should review all relevant data and *clearance* should be given prior to dismantling the abatement enclosures and release of the abatement areas.

- 7) If such abatement cannot take place promptly, then, as a short-term measure, those portions of building materials showing evidence of fungal growth and/or water damage should remain isolated behind the cove base.
- 8) Be advised that the exposure data recorded during this survey may not be sufficiently broad to adequately assess the suitability of the indoor air quality for all individuals, particularly those who are extremely sensitive to certain chemical and/or biological substances, or for those individuals with immune system deficiencies. Although not expected, if persons entering Room 143 do experience non-specific ill effects of unknown etiology, then those affected should be referred to a medical professional in order to determine or specify the possible cause(s) of such reactions. If more information becomes available, further investigation and air monitoring may be warranted.

If you have any comments or questions regarding the information contained in this correspondence, please feel free to contact our offices directly at (310) 370-8370.

Sincerely,

**HYGIENE TECHNOLOGIES INTERNATIONAL, INC.**

Kenny K. Hsi, CIH  
Technical Director

Brian P. Daly, CIH, PE  
President

# HYGIENE TECHNOLOGIES INTERNATIONAL, INC.

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## APPENDIX A



TABLE 20710005-5  
AIRBORNE TOTAL FUNGI RESULTS  
MAIL ROOM  
450 N STREET  
SACRAMENTO, CALIFORNIA  
OCTOBER 19, 2007

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Results reported in spores per cubic meter of air (spores/M<sup>3</sup>)

SAMPLE NUMBER	20710005-TM501OUT	20710005-TM502	20710005-TM503	20710005-TM504
SAMPLING LOCATION/ACTIVITIES	Outdoors; about 20 feet southwest of mailroom western exit; approximately five feet above ground/Normal outdoor activities	First floor; Room 143; northern portion; about center; approximately five feet above floor/Sampling activities only	First floor; Room 143; southeastern portion; about center; approximately five feet above floor/Sampling activities only	First floor; Room 143; southwestern portion; about center; approximately five feet above floor/Sampling activities only
DATE	10-19-07	10-19-07	10-19-07	10-19-07
START/STOP	17:38:00/17:43:00	17:50:00/17:55:00	17:58:00/18:03:00	18:05:00/18:10:00
SAMPLE TIME	5 minutes	5 minutes	5 minutes	5 minutes
Alternaria	27	13		
Arthrimum				
Ascospores	107		53	
Aureobasidium				
Basidiospores	800	213		160
Bipolaris/Drechslera group				
Botrytis				
Chaetomium				
Cladosporium	3,570	320	107	213
Curvularia	13			
Epicoccum				
Fusarium				
Oidium				
Penicillium/Aspergillus types	160	267		
Pithomyces				
Rusts				
Smuts (Periconia, Myxomycetes)	13			
Stachybotrys				
Torula				
Ulocladium				
Unidentified mitosporic fungi				
Hyphal fragments/m <sup>3</sup>	27	<13	<13	13
Background particulates*	2+	2+	2+	2+
TOTAL **	4,690	813	160	373

\*Background debris is an indication of the amount of non-biological particulate matter present on the slide and is graded (from least to greatest) as 1+ to 4+.

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TABLE 20710005-5  
AIRBORNE TOTAL FUNGI RESULTS  
MAIL ROOM  
450 N STREET  
SACRAMENTO, CALIFORNIA  
OCTOBER 19, 2007

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### Results reported in spores per cubic meter of air (spores/M<sup>3</sup>)

SAMPLE NUMBER	20710005-TM505OUT			
SAMPLING LOCATION/ACTIVITIES	Outdoors; about 20 feet southwest of mailroom western exit; approximately five feet above ground/Normal outdoor activities	This column intentionally left blank	This column intentionally left blank	This column intentionally left blank
DATE	10-19-07			
START/STOP	18:13:00/18:18:00			
SAMPLE TIME	5 minutes			
Alternaria	40			
Arthrimum				
Ascospores				
Aureobasidium				
Basidiospores	533			
Bipolaris/Drechslera group				
Botrytis				
Chaetomium				
Cladosporium	5,550			
Curvularia				
Epicoccum	13			
Fusarium				
Myrothecium				
Oidium				
Penicillium/Aspergillus types	213			
Pithomyces				
Rusts				
Smuts (Periconia, Myxomycetes)	27			
Stachybotrys				
Torula				
Ulocladium				
Hyphal fragments/m <sup>3</sup>	<13			
Background particulates*	2+			
<b>TOTAL **</b>	6,376			

\*Background debris is an indication of the amount of non-biological particulate matter present on the slide and is graded (from least to greatest) as 1+ to 4+.

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TABLE 20710005-6  
SURFACE FUNGAL GROWTH POTENTIALS  
MAIL ROOM  
450 N STREET  
SACRAMENTO, CALIFORNIA  
OCTOBER 2007

SAMPLE NUMBER	SAMPLING LOCATION	AMORPHOUS DEBRIS	MISCELLANEOUS FUNGI/POLLEN*	FUNGI SEEN WITH UNDERLYING MYCELIAL AND/OR SPORULATING STRUCTURES**	OTHER COMMENTS	GENERAL IMPRESSION
20710005- TL01	First floor; Room 143; northern perimeter wall; about center; approximately 2 inches above floor; from vertical surface of concrete and mastic	Moderate	Very few	2+ colorless spores typical of <i>Penicillium</i> / <i>Aspergillus</i> (spores, hyphae)	None	Fungal growth
20710005- TL02	First floor; Room 143; northern perimeter wall; about center; approximately 3 inches above floor; from vertical surface of concrete and mastic	Moderate	Very few	1+ colorless spores typical of <i>Penicillium</i> / <i>Aspergillus</i> (spores, hyphae)	None	Fungal growth

\*Includes basidiospores (mushroom spores), myxomycetes, plant pathogens such as ascospores, rusts and smuts, and a mix of saprophytic genera with no particular spore type predominating (indicative of normal trapping).

\*\*Quantities of fungi are graded (from least to greatest) as <1+ to 4+.



1			
Date	Address	Photo Location – Description	Up
10/19/07	450 N Street Sacramento, California	First floor; Room 143 (Mail Room); looking down and northwest; view of northern concrete partition wall; showing partial encapsulation of affected area	↑

2			
Date	Address	Photo Location – Description	Up
10/19/07	450 N Street Sacramento, California	Close-up of Photo 4; showing suspect fungal growth on lower wall and mastic where the vinyl cove base was previously installed	↑